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Van Hal et al.

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(54) HAIR DETECTION DEVICE

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See application file for complete search history.

(56)References Cited

U.S. PATENT DOCUMENTS

6,955,672 B2*	* 10/2005	Cense et al 606/9
6,976,984 B2*	* 12/2005	Cense et al 606/9
2003/0036751 A1*	* 2/2003	Anderson et al 606/9
2003/0050561 A1	3/2003	Bazin et al.
2008/0255548 A1*	* 10/2008	Van Hal et al 606/10

FOREIGN PATENT DOCUMENTS

WO	WO 9911324 A1 *	3/1999
WO	WO 00 62700	10/2000
WO	WO 2004 008114	1/2004

* cited by examiner

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(57)ABSTRACT

A hair-detection device with a source of electromagnetic radiation, an imaging sensor and a radiation selection means. The selection means improves a ratio between a part of emitted radiation that is coupled into a skin which reaches the sensor and thus provides an image of the skin, and the part that reaches the sensor via other ways, such as reflection at the skin surface. The radiation may have a wavelength between about 700 nm and 1100 nm. The radiation selection means may for example include a separate wall around at least one of the source and the sensor, such as crossed polarizers. By means of this selection, the contrast of the image may be improved, and may be made less dependent on skin color and skin artifacts, thus enabling easier detection of for example, white hairs on a fair skin.

18 Claims, 3 Drawing Sheets

